UNIVERSITY OF ILLINOIS EXTENSION
College of Agricultural, Consumer, and Environmental Sciences

Illinois Fruit and Vegetable News

Vol. 12, No. 13, August 22, 2006
a newsletter for commercial growers of fruit and vegetable crops

"We are what we repeatedly do. Excellence, then, is not an act, but a habit." Aristotle

Address any questions or comments regarding this newsletter to the individual authors listed after each article or to its editor, Rick Weinzierl, 217-333-6651, weinzier@uiuc.edu. The ***Illinois Fruit and Vegetable News*** is available on the web at: http://www.ipm.uiuc.edu/ifvn/index.html . To receive email notification of new postings of this newsletter, call or write Rick Weinzierl at the number or email address above.

For your calendar … . **Illinois Pumpkin Field Day** on September 8 at the University of Illinois Vegetable Research Farm near Champaign, IL. **Strawberry Plasticulture Planting Workshop** on September 26 at Bill Bass' farm south of Carbondale. **2006 Midwest Apple Improvement Association Annual Meeting** at the St. Claire County Farm Bureau Building, October 4. See Elizabeth Wahle's notes below for details on these three programs. **NAFEX**, the North America Fruit Explorers Association, in Lexington, KY, August 30 through September 1 … see Chris Doll's notes from the August 4th issue of this newsletter for details. **Illinois Specialty Crops and Agritourism Conference**, January 11-13, 2007, at the Crowne Plaza Hotel, Springfield … details to follow in later issues of this newsletter … see Elizabeth Wahle's notes below about the cider and hard cider contests.

In this issue ...

Regional Updates

In southern and southwestern Illinois … In my last newsletter, the southern region was under a severe weather alert, but I'm glad to report that almost everyone dodged the bullet this time. Rainfall was again very spotty, but most everyone got enough rain in the last week to green everything back up. Temperatures and humidity have moderated for the time being, making work outside much more tolerable. One notable improvement, I was able to enjoy my first unmolested roses in quite awhile -- the Japanese beetle adult phase seems to be at an end for the year.

It seems odd, but peach season is over for some growers in the southern region—at least for those whose latest variety was Cresthaven. There is always something to take up the slack though. The southern region has moved into apples--Gala came on the market last week, and has surprisingly good color for the amount of heat units recently. Grape harvest is in full swing as well. Already harvested are varieties such as Foch and Edelweiss, followed by Saint Croix and NY-76. Interestingly, the heat during the growing season has really shortened the difference in harvest dates between the southern and central regions. A grower in northern Calhoun expects his Chambourcin to come in almost a month early

Moth counts on corn ear worm seem to have leveled off, but corn borer and yellow wooly bear are still making their presence known. Some growers are harvesting early market pumpkins as well as winter squash and gourds now.

If you are a pumpkin grower, plan to attend the 4th annual Illinois Pumpkin Field Day. The field day is set for Friday, September 8th at the University of Illinois Vegetable crops Research Farm in Champaign, IL. The program is scheduled from 10:00 am to 2:00 pm and will include a tour of research plots and discussions on fertility and production, mulch management,

variety testing, weed control, insect pests, and disease control. Registration is free, and lunch will be provided. This is a great opportunity not only to hear about upcoming advances in pumpkin production, but also to see these advances in field trials. Details of the program, including direction to the Vegetable Crops Research Farms is posted at http://web.extension.uiuc.edu/regions/hort/.

For growers interested in strawberry plasticulture production, a planting workshop is being held Tuesday, September 26th, at 5:00pm. The workshop is sponsored by University of Illinois Extension and will be hosted by Bill Bass at his farm located six miles south of the Southern Illinois University-Carbondale campus on the northeast corner of Bass Lane and US Route 51. Bernie Colvis, a leader in Midwest plasticulture strawberry production, will be the featured speaker. Bernie will have on hand his planting equipment and will discuss the finer details associated with successful establishment of a strawberry plasticulture system. For more information, contact Elizabeth Wahle at wahle@uiuc.edu or 618-692-9434, or Jeff Kindhart, Dixon Springs Ag Center, at jkindhar@uiuc.edu or 618-695-2444.

The 2006 Midwest Apple Improvement Association Annual Meeting will be held Wednesday, October 4th. Registration at the door is $10.00 (includes lunch) and begins at 7:30 am at the St. Clair Farm Bureau. The afternoon program will move to Eckert's Country Store & Farms in Belleville for a tour of seedling blocks. Invited speakers for the morning program include Jim Eckert (MAIA President), Peter Hirst (Purdue University), Diane Miller (The Ohio State University), Wally and Wanda Heuser (Summit Sales), Mitch Lynd (Lynd Fruit Farm), and Chris Doll (University of Illinois Extension, retired). A complete program is posted at http://web.extension.uiuc.edu/regions/hort/. For further details, contact Elizabeth Wahle.

Mark your calendars now. For those individuals needing to update their Illinois Food Handler license, a (5) hour recertification training will be held January 11th in conjunction with the IL Specialty Crops Conference at the Crowne Plaza in Springfield, IL. This recertification course will meet all requirements for Illinois Department of Public Health, and will be taught by a University of Illinois Nutrition and Wellness Educator. This recertification is required every five years, and individuals attending must hold an **unexpired** license. There will be a fee (to be determined at a later date), and it will include all training materials, snacks and meals. Attendees must be present for the full five hours of training. If you are attending the Illinois Specialty Crops Conference, this is a good opportunity to complete your recertification too. For further details, contact Elizabeth Wahle at wahle@uiuc.edu or 618-692-9434.

Illinois apple cider makers will again get a chance to see who's the best in the state. After a successful run last January, the 18th Annual Cider Contest and the 5th Annual Hard Cider Contest will again be hosted at the Illinois Specialty Crops Conference in Springfield, January 11 -13, 2007, and will be sponsored by the Illinois State Horticulture Society. Illinois contestants will compete against other Illinois producers for the Illinois State awards. Illinois cider makers will also have the opportunity to submit their best ciders to challenge the out-of-state entries for the North American and Midwest Awards. Midwest awards are open to states surrounding and including Illinois, and North American awards are open to all cider makers in North America. For the Apple Cider Contest, contestants are asked to submit a one-gallon full container of unclarified apple cider that may be fresh or have been stored frozen. Previously frozen samples must be thawed by10:00a.m. on Friday, January 12th in time for judging. For contestants unable to register in person, ship your cider directly to the conference: Crowne Plaza, Attn: Sarah Lynch, 3000 Dirksen Parkway, Springfield, IL 61703. Be sure to label shipped packages "Cider Judging Entry–Keep Refrigerated." Shipped entries will be accepted by the hotel 48 hours prior to the start of the conference. Those making hard apple cider will want to get started now in order to have the maximum amount of fermentation time. Make sure your product is hard apple cider, not hard apple cider wine. Although there is no definite break or definition where hard apple cider stops and where wine starts, we are looking for a hard apple cider product with alcohol content below 8%. Hard apple ciders containing other fruit flavoring, such as pear, cherry, peach, or cranberry will not be considered for judging. Hard apple cider contestants are asked to submit a one-quart, but no more than a one-gallon container of product for the hard apple cider-judging contest.

Registration for all apple cider contests will be on Friday, January 12th, from 8:00-9:45am. Judging will commence at 10:00am. The fee will be $10 per entry. Awards will be announced during the dinner banquet on Friday, January 12th. For additional Cider Contest and Hard Cider Contest information, contact Elizabeth Wahle, Contest Coordinator.

I mentioned a new internet site, set up by the University of Missouri Extension, has been launched in an effort to bring producers and chefs together. The Illinois-Missouri Food Circle Networking is an outgrowth of the bi-state "To Market, To Market" directory which lists farmers markets, roadside stands and u-pick farms in the immediate St. Louis area. Producers, who would like to let chefs know what they have for sale simply need to go to http://extension.missouri.edu/jefferson and click on the button "Food Circle Networking." Then simply click on the "Producer's Check In" button, fill out the form with information on the foods you have. The website is designed to be viewed by both chefs and producers as a way to cultivate relationships and keep each other informed without the hassle of making many phone calls. For further details, contact Elizabeth Wahle.

Elizabeth Wahle (618-692-9434; wahle@uiuc.edu)

At the Dixon Springs Agricultural Center … Propagation of strawberry runner tips is underway. The resulting plants will be field set around September 20, 2006. Growers are invited to a strawberry plasticulture twilight meeting on September 26, 2006 at the farm of Bill Bass located in Union County, IL, about 5.5 miles south of Carbondale on Route 51. Presentations will be given by Bill Bass and Bernie Colvis. Growers seeking additional information can email jkindhar@uiuc.edu. More information including a map will be provided in the next newsletter.

Strawberry research at DSAC for the 2006/2007 season will include a project with Dr. Mosbah Kushad to examine boron fertility issues associated with strawberry plasticulture. We will also be conducting studies looking at the effect of humic acid in pre-plant and pre-plant plus side dress applications.

Tomato and pepper cultivar trials are winding down, and buckwheat and mustard cover crops have been sown on some plots at DSAC. A fall broccoli project on insect control with Dr. Rick Weinzierl is underway.

Propagation of strawberry runner tips at the Dixon Springs Ag Center.

Jeff Kindhart (618-695-2444; jkindhar@uiuc.edu) and Bronwyn Aly (618-695-2444; baly@uiuc.edu)

In northern Illinois … The last 2 weeks have been characterized by sunny days with highs in the upper 70s to 90s, and night temperatures in the upper 50s to low 70s. The area received _ to 2 inches rainfall during the August 3-21 period. Soil moisture has been very low, so irrigation is in use on many farms. Orchardists continue with summer spray programs to control apple scab and summer diseases such as sooty blotch and flyspeck. Insect control is ongoing with sprays targeting codling moths, Japanese beetles, apple maggots, mites, and leafrollers. For calcium sprays, it's time to increase rates to 12 lb of calcium chloride per acre or equivalent amounts depending on the product the grower is using to control calcium deficiency related apple fruit disorders such as cork spot and bitter pit. Some pick-your-own apple orchards are open, and the customers are picking early maturing apple varieties such as Redfree, Pristine, William's Pride, and Zestar. Peaches and pears are also ready for picking in some orchards. Birds are a problem in grapes, so it is time to cover the vines with nets and use other bird scaring devices.

Sweet corn, muskmelons, tomatoes, peppers, eggplant, and squash harvesting is going on in the region. Corn earworm moth counts are high, and growers need to check the traps frequently and spray as needed. Sun scald has been very common on fruiting vegetables, particularly in some pepper varieties. Bacterial canker and early blight was observed on tomato fruits and leaves respectively. Western corn rootworm beetles and cucumber beetles were observed on vine crop leaves and blossoms. Fall armyworm larvae and western corn rootworm adults have also been reported on sweet corn. Aphids have also been observed in vegetable fields, particularly on the underside of the leaves. In pumpkins and squash, I observed powdery mildew on leaves and mosaic virus symptoms on new growth. Some apparent incidence of downy mildew was observed in muskmelons, but this still needs to be confirmed by laboratory diagnosis.

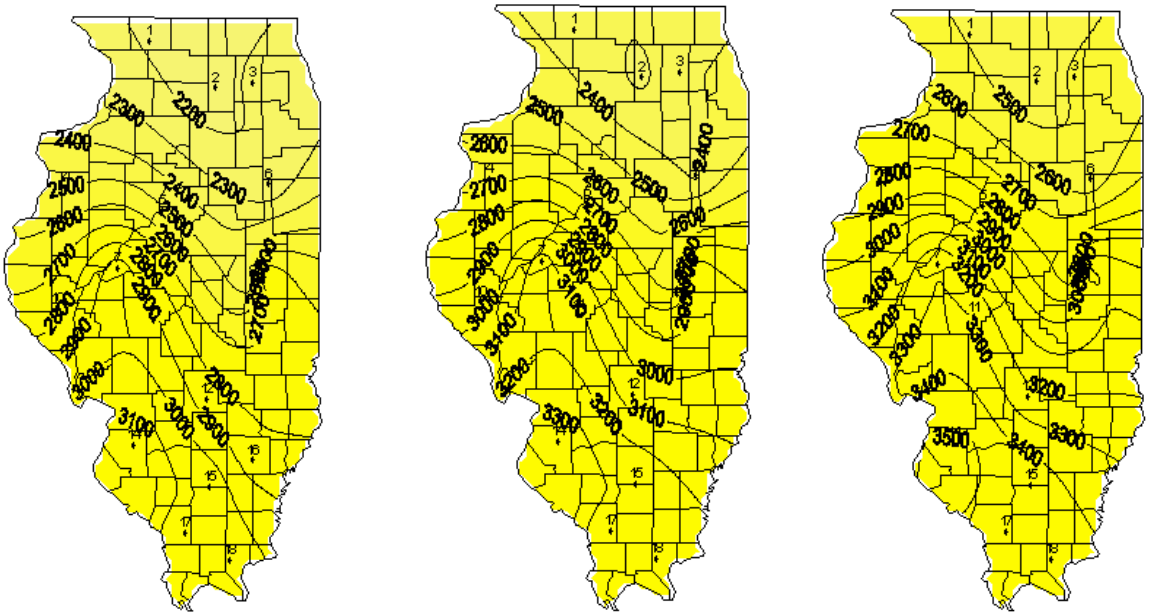
Maurice Ogutu (708-352-0109; ogutu@uiuc.edu)

Degree-Days

Degree-day accumulations listed below for weather stations in the Illinois State Water Survey WARM data base have been summarized by using the Degree-Day Calculator site on the University of Illinois IPM site (http://www.ipm.uiuc.edu/degreedays/index.html). The list below includes only degree-day accumulations and projections based on a 50-degree F developmental threshold and a January 1 starting date, but other options that use different thresholds and specific biofix dates are available on the Degree-Day Calculator. The degree-day calculator is available as a result of a joint effort of extension entomologists (primarily Kelly Cook) and Bob Scott of the Illinois State Water Survey. If you have questions about how to use the site, contact me or Bob Scott (rwscott1@uiuc.edu).

Degree-day accumulations, base 50 degrees F, starting January 1.

Station	County	Base 50F DD Jan 1 – Aug 21 Historic Average	Base 50F DD Jan 1 – Aug 21 2006	Base 50F DD Jan 1 – Aug 28 (Projected)	Base 50F DD Jan 1 – Sep 4 (Projected)
1. Freeport	Stephenson	2215	2202	2353	2489
2. Dekalb	Dekalb	2252	2132	2274	2403
3. St. Charles	Kane	2149	2254	2397	2527
4. Monmouth	Warren	2400	2499	2655	2801
5. Peoria	Peoria	2536	2535	2701	2854
6. Stelle	Ford	2368	2227	2384	2529
7. Kilbourne	Mason	2625	2978	3146	3299
8. Bondville	Champaign	2512	2447	2603	2750
9. Champaign	Champaign	2599	2810	2978	3137
10. Perry	Pike	2559	2765	2937	3095
11. Springfield	Sangamon	2745	2944	3124	3292
12. Brownstown	Fayette	2852	2860	3040	3212
13. Olney	Richland	2824	Missing	Missing	Missing
14. Belleville	St. Claire	2919	3210	3388	3557
15. Rend Lake	Jefferson	3032	3110	3297	3476
16. Fairfield	Wayne	2979	Missing	Missing	Missing
17. Carbondale	Jackson	2932	3082	3261	3432
18. Dixon Springs	Pope	2995	3092	3275	3451



Degree days, base 50 degrees F, since January 1, 2006.
Left: January 1 – August 21; center: January 1 – August 28 (projected); and right: January 1 – September 4 (projected).

Rick Weinzierl (217-333-6651; weinzier@uiuc.edu)

Notes from Chris Doll

After some scattered showers, green grass and weeds are now in the landscape. Recent rainfall amounts in the area varied from 1.0 to 3.0 inches, and luckily the latter amount fell on the Back 40. The positive effects offset the negatives of mowing and re-applying cover sprays. Harvest of Gala and Ginger Gold is past and that of Honeycrisp has begun. Spot picking of all three varieties (and also Golden Supreme) improves the overall market quality of the final product. Some Jonathans were on the local farmers market this past weekend and the sugars are coming. Color will too if cooler temperatures make it here. Peach harvest has moved past the Cresthaven season. Encore fruits have begun the final swell. I just picked my tree of Sweet Dream, a subacid yellow peach with dark red skin and good hanging ability. I like the color and firmness as well as the flavor. However, the catalog description says that it is susceptible to bacterial spot, so time will tell if it will make it in this area.

Bacterial spot of peaches has been a discussion topic on "Apple Crop". The disease is causing problems for eastern growers and is more prevalent in some Illinois orchards too. Susceptibility to the disease varies by variety, and most of the varieties suggested for this area are not as susceptible as many of the nectarines, white peaches and varieties bred for drier areas. I have seen severe infections on peaches planted near or with highly susceptible peach and nectarine varieties. The use of Mycoshield and recommended copper compounds has helped give some control.

My degree day total from codling moth biofix is now 2806. Ten days ago, the codling moth larvae in this latitude were mostly in the first instar. San Jose scale has been seen on both apples and peaches in the area. Not severe, but enough that growers should watch for heavy infestation areas, if any, to concentrate control methods for next year. My observation has been that oil sprays will give control if the rate and coverage is adequate.

Most of the apple drop I've seen has been from drop-susceptible varieties such as Honeycrisp and Golden Supreme, and push-off susceptible varieties such as Jonathan. NAA should work on tightening the first two, and on Jonathan if the looseness is normal. However, with rains helping size increase, the push-offs will happen when apples are clustered or paired. NAA can help "stick" apples on the tree if applied in time, and it is usually difficult to see if maturity is hastened. As for when to pick apples, Dr. Peter Hirst of Purdue wrote in the August 2, 2006 issue of Facts for Fancy Fruits that "there are various tests for telling when fruits are ripe, but taking a bite out of a few apples is just as good an indicator as any test."

Climbing milkweed vines are into many apple trees causing shading and loss of marketable fruits. The plants are also blooming and will make a large seed crop in the pods that form. The control now is mostly mechanical as cutting of the stem with some tool is needed to kill the top growth. Chemicals such as Grammoxone and Rely sprayed on the stems will sometimes girdle tender and small (<than 1/8th inch diameter) stems but not the old and thicker stems. I am still waiting to hear of the best method of controlling this pestiferous weed.

Two State Fair items: Congratulations to Braetigaum Orchards of Belleville, Ringhausen Orchards of Fieldon, Apple-Hill Orchard of Winchester, and Gilliam Orchards of Cuba for many great and good fruit exhibits. All were recipients of many awards. Judging gives me the opportunity to see some of the older varieties such as Lodi, and Wealthy apples, Premier plums, and Fredonia grapes. But nostalgia set in as the ring-faced bushel baskets of apples, peaches and pears were eliminated in favor of peck baskets. Secondly, the Illinois Specialty Growers Association sale of Illinois produce drew lots of attention and sales of beautiful Cresthaven peaches. Many were repeat customers from the 2005 Fair.

Chris Doll

Fruit Production and Pest Management

Updates on Codling Moth Phenology

Based on data provided by Bronwyn Aly at Dixon Springs, Gary Grammer near Murphysboro, Sissy Erbacher of Eckert's Orchard at Belleville, Chris Doll at Edwardsville, Kenny Horn from the University of Illinois orchard at Urbana, Curt Christ near Elmwood, and Ken Hall near Poplar Grove, biofix dates for codling moth are listed for six locations in the table below, along with degree-day accumulations and projections for the weather station sites nearest each orchard. (Note that there is no reporting weather station near Edwardsville, so I've used the Springfield station as the best option.)

Orchard Location	Weather Station	Codling Moth Biofix Date	DD_{50} through Aug 21, 2006	DD_{50} projected through Aug 28	DD_{50} projected through Sep 4
Dixon Springs / Murphysboro	Dixon Springs	April 17	2669	2852	3026
Belleville	Belleville	April 20	2798	2976	3142
Edwardsville	Springfield	April 23	2643	2822	2988
Urbana	Champaign	May 1	2461	2629	2785
Elmwood	Peoria	May 6	2186	2351	2501
Poplar Grove	Freeport	May 10	1938	2088	2221

Codling moth development:

Beginning of second generation egg hatch	~1120 DD_{50} after biofix
50 percent of second generation moths emerged	~1349 DD_{50} after biofix
50 percent of second generation eggs hatched	~1580 DD_{50} after biofix
First moths of third generation emerge	~1920 DD_{50} after biofix
99 percent of second generation eggs hatched	~2100 DD_{50} after biofix
Beginning of third generation egg hatch	~2160 DD_{50} after biofix
*First moths of fourth generation emerge	~2900-3000 DD_{50} after biofix
*Beginning of fourth generation egg hatch	~3200 DD_{50} after biofix

(Table based on ***Orchard Pest Management*** by Beers et al., published by Good Fruit Grower, Yakima, WA.)
* Extrapolated from the model presented by Beers et al.

Oriental Fruit Moth Phenology

We do not have a broadly representative monitoring program for oriental fruit moth (less so than for codling moth), but biofix dates for first generation flight were approximately April 7 in the Belleville area and April 10 for lower Calhoun County. Based on a 45-degree F developmental threshold and an upper cut-off of 90 degrees F, degree-day accumulations for the Belleville area and Springfield (best available data site for Calhoun Co.) are listed in the table below. Each generation takes approximately 950 DD base 45 F to develop.

Orchard Location	Weather Station	OFM Biofix Date	DD_{45} through Aug 21, 2006	DD_{45} projected through Aug 28	DD_{45} projected through Sep 4
Belleville	Belleville	April 7	3642	3854	4055
Southern Calhoun County	Springfield	April 10	3448	3662	3863

Oriental fruit moth development (beginning with occurrences that are pertinent at this time):

Peak egg-laying for third generation	~2500 DD_{45} after biofix
First moths of fourth generation	~2850 DD_{45} after biofix
Peak egg-laying for fourth generation	~3500 DD_{45} after biofix

(Table adapted from data from ***Common Tree Fruit Pests*** by Howitt., published as NCR 63 by Michigan State University, East Lansing, MI, 1993.)

Rick Weinzierl (217-244-2126, weinzier@uiuc.edu)

Color Development in Apples

Cooler nights and warmer days are coloring brushes for red apples. The pigment in red apples is called anthocyanin or more precisely idaein (cyanidin-3-galactoside). Light is very important for the formation of this pigment. Some studies have shown that red light is very important for the formation of the pigment while others stress the importance of ultraviolet or blue light. Regardless, light is very important for red apple color. Most of the light comes from direct sunlight, but a good percentage comes from scattered sunlight or diffuse light. Several factors affect light penetration and reception by the fruit. Diffuse light can account for as much as 70% of the total light received by the fruit when the air is dry. Fruits in poorly pruned trees receive 70% less light than adequately pruned trees and that will negatively affect fruit color. The critical range for light interception is about 30% of full sunlight; any thing less will have negative effect on fruit color. Interestingly, some varieties like Macon and Arkansas Black will develop some color even in the dark. The same is also true for grapes, plums, raspberries, and blueberries. Also, some highly coloring cultivars of apples like "Buckeye Gala" will color much sooner than "Royal Gala". Another factor that contributes to better apple color development is temperature. Although to my knowledge

there is no hard evidence to back it up, cool temperature before harvest, especially at night will increase anthocyanin synthesis in some apple varieties. Westwood argued that it could be related to higher carbohydrate availability due to reduced rate of respiration at cool temperature. Because it is difficult to predict if the weather will turn cool before harvest, it is best to do a good job on pruning the tree in the winter. You may also avoid fertilizing the trees, especially with nitrogen to prevent excessive vegetative growth that shades the trees.

Although red color is an adequate indicator of fruit maturity, highly coloring cultivars make it less than perfect for many varieties. Some growers use ground color; the color on the shaded side of the fruit to predict maturity of some red varieties like "Delicious" and "Jonathans." Fruits are harvested when the ground color is a pale to white green rather than deep color green. Fruit firmness is also a factor for measuring maturity, but fruit firmness by itself is not good either. On average fruits that are firmer than 20 lb are not ready for harvest while fruits less than 10 lb are too soft. The level of soluble solids is another factor that is commonly used to predict maturity. Twelve percent soluble solids is the lowest level at which apples should be harvested, assuming that the fruit still have some starch left to convert into sugars. Again soluble solids is a better indicator of how sweet the fruit is but will not predict if the fruit will get sweeter later or if they can be stored for a long time. Starch is also used to predict maturity. On a scale of 1 to 5 (1 very starchy and 5 no starch) fruit should be harvest when some of the starch starts to disappear. Fruits that are going to be stored for a longtime should have a starch rating of 2 to 3, while fruits that are going to be eaten soon after harvest should be picked when the starch level is 4 or 5. Starch level by itself is also not good because sometimes the starch breaks down very rapidly but the fruit does not have good color. This usually happens when the weather is very hot. The best way to predict maturity is to use a combination of firmness, soluble solids, starch, and color.

Mosbah Kushad (217-244-5691; kushad@uiuc.edu)

Vegetable Production and Pest Management

Updates on diseases of squash and pumpkins in Illinois

Powdery mildew and viral diseases have been observed widely in squash and pumpkin fields in Illinois in the past three weeks.

Powdery mildew, caused by the fungi *Podosphaera xanthii* (syn. *Sphaerotheca fuliginea*) and *Erysiphe cichoracearum*, is one of the important diseases of cucurbits in Illinois and occurs every year. Although this disease develops from late July until harvest, it reduces yield and quality of crop significantly. Powdery mildew is diagnosed by white, powdery mold on plant tissues. Powdery fungal growth develops on both leaf surfaces, petioles, and stems. The disease first appears on lower stems and petioles (Fig. 1). As the disease continues to develop, the white, moldy spots occur on the underside of leaves (Fig. 2), then on the upper leaf surfaces (Fig. 3). Yellow spots may form on upper leaf surfaces opposite to powdery mildew colonies on the underside of leaves. Infected leaves usually wither and die.

Figure 1. Powdery mildew on stems.

The primary inoculum is airborne conidia dispersed over long distances from greenhouse grown cucurbits and alternate hosts, and possibly cleistothecia (sexual fruiting body of the fungus). Cleistothecia, produced late in the growing season, are small, dark structures with thick walls that contain sexual spores.

Powdery mildew develops quickly under favorable conditions (dense plant growth, low-intensity light, high relative humidity). The time between infection and symptom appearance is usually 3-7 days, and a large number of spores can be produced in this time. Infection can occur at 50–90°F. Powdery mildew can be managed effectively by planting resistant/tolerant cultivars and application of fungicides. Resistance in the plants is usually partial and may require additional complementary control practices. Fungicide application is a common control practice of powdery mildew. Plants should be inspected weekly beginning at fruit set initiation and sprayed with fungicides at the first sign of disease. To accomplish effective control of powdery mildew, good fungicide coverage is needed on the undersides of leaves and inside the canopy. Spray volume of 50 gallons or more, applied with a pressurized sprayer, should provide a good coverage of the canopy. To minimize the potential of resistance development in the pathogens, systemic fungicides should be applied with contact fungicides, and systemic fungicides with different modes of action should be alternated. Fungicides that are effective against powdery mildew include Amistar, Cabrio, Flint, Nova, Pristine, Procure, Quadris, and Topsin-M. For the updates on the chemical control of powdery mildew, consult the Midwest Vegetable Production Guide for Commercial Growers (www.entm.purdue.edu/entomology/ext/targets/ID/index.htm).

Viral Diseases. Most viral diseases of cucurbits in Illinois are caused by Cucumber mosaic virus (CMV), Papaya ringspot virus (PRSV), Potyvirus, Squash mosaic virus (SqMV), Tobacco ringspot virus (TRSV), Tomato ringspot virus (ToRSV), Watermelon mosaic virus (WMV), and Zucchini yellow mosaic virus (ZYMV). However, during surveys in 2004 and 2005, we detected Potyvirus (other than WMV, ZYMV or PRSV), Tobacco ring spot virus TRSV), and Tomato ring spot virus (ToRSV).

Cucumber mosaic virus (CMV) on squash leaves

Papaya ringspot virus (PRSV) on squash leave and fruit

Watermelon mosaic virus (WMV) on a squash leaf

Zucchini yellow mosaic virus (CMV) on a squash leaf

Cucumber mosaic virus (CMV) causes foliar mosaic and mottled fruit. CMV can infect more than 800 plant species, including many vegetable crops, ornamentals, and woody plants. Many weeds and cultivated crops are reservoirs of this virus. CMV is transmitted by more than 60 aphid species. Planting resistant cultivars can control CMV. Eradication of weed hosts is often impossible. The use of insecticides cannot prevent spread of the virus.

Papaya ringspot virus (PRSV) causes plant stunting, mosaic and fern-leaf appearance on foliage, and color breaking and malformation on fruit. The natural host range of PRSV is confined to the plants in Cucurbitaceae family. PRSV is transmitted by more than 20 aphid species. To control this disease, resistant/tolerant cultivars should be planted. Application of insecticides controls aphid, but is ineffective for controlling papaya ring spot.

Squash mosaic virus (SqMV) causes vein banding, mosaic, mottling, and blister on foliage. Plants are often stunted, producing malformed and mottled fruit. SqMV is a seed-borne pathogen. This virus is transmitted by the striped and spotted cucumber beetles. Use of virus-free seed is an important control measure. Spread of the virus can be reduced by controlling beetle vectors by using insecticides.

Tobacco ringspot virus (TRSV) causes bright yellow mosaic, ring spots, necrosis, and distortion in infected foliage. Fruits may be aborted, or remain small and become mottled and distorted. TRSV can infect a large number of woody plant species

(e.g., apple, ash, blackberry, blueberry, dogwood, grapevine, etc.). TRSV is transmitted by nematodes. Also, this virus may be transmitted by thrips, grasshoppers, flea beetles, and some aphids. Intense cultivation and weeding reduce the presence of the vectors and incidence of the disease.

Tomato ringspot virus (ToRSV) causes yellow mosaic, reduction in leaf size, shortened internodes, proliferation of flower buds, and ringspots on the distorted fruits. ToRSV is vectored by nematodes. This virus is easily transmitted by mechanical means, and pollen. Intense cultivation and eradication of weeds reduces the presence of the disease.

Watermelon mosaic virus (WMV) infects most of the cucurbits and many leguminous species. WMV causes green mosaic, leaf rugosity, green vein banding, chlorotic rings, and malformation on foliage, and green ringspots and mottling on fruit. WMV is spread by more than 20 aphid species. The use of resistant cultivars can control WMV. The use of insecticides, however, cannot prevent spread of this virus.

Zucchini yellow mosaic virus (ZYMV) causes yellow mosaic, extreme fernlike appearance of leaf tissue, and bumpy and mottled fruit. ZYMV is spread by several aphid species. The use of resistant cultivars (if available) should be considered. The use of insecticides cannot prevent spread of the virus.

Mohammad Babadoost (217-333-1523; babadoos@uiuc.edu)

Notes on Vegetable Insects … updates on corn earworm

Corn earworm moth counts in pheromone traps remain high (well into the hundreds at some locations) for most reporting sites in Illinois. Where counts exceed 50 moths per trap per night, intense control programs are needed, with applications on intervals of no greater than 2 to 3 days in fresh-market sweet corn. Tomato and pepper producers also should be controlling corn earworm at this time. Previously I have mentioned concerns about the possibility of resistance to pyrethroids in corn earworm populations that migrate into the region every year from the south. Bioassays reported by Rick Foster from Indiana earlier this month provide evidence of at least some level of resistance in the population near West Lafayette, but how to interpret bioassay results to predict field efficacy is still not really clear. In an insecticide trial just harvested and evaluated at St. Charles last Friday, Capture (a pyrethroid) applied on a 3- or 4-day interval gave fairly good control – 4 corn earworms per 100 ears compared to 63 corn earworms per 100 ears in the untreated check. Infestations in plots treated with Entrust and Larvin (not pyrethroids) were 6 and 5 corn earworms per 100 ears, respectively, basically the same as in the Capture-treated plot. My quick initial interpretation of these results is that the population demonstrated little or no resistance to pyrethroids and that all of these products would have given slightly better control had we applied them on a 2-day interval as many commercial growers must do to prevent contamination of fresh-market sweet corn during periods of heavy earworm pressure. If pyrethroid resistance occurs at levels that cause control failures in the field, it is likely that such resistance will not influence the effectiveness of Larvin or Entrust (or SpinTor), and our initial results indicate that these alternative chemistries might provide effective control. Within the next 10 days we will harvest a more extensive sweet corn insecticide evaluation plot at Urbana.

Rick Weinzierl (217-333-6651; weinzier@uiuc.edu)

Words of Wisdom

From Alaska …

- On a t-shirt … Bears love tourists … they taste like chicken.
- In a restaurant … If you're drinking to forget, please pay first.

University of Illinois Extension Specialists in Fruit Production and Pest Management

Extension Educators in Food Crop Horticulture		
Bill Shoemaker, St. Charles Res. Center	630/584-7254	wshoemak@inil.com
Maurice Ogutu, Countryside Extension Center	708-352-0109	ogutu@uiuc.edu .
Elizabeth Wahle, Edwardsville Extension Center	618-692-9434	wahle@uiuc.edu
Bronwyn Aly, Dixon Springs Agricultural Center	618-695-2444	baly@uiuc.edu
Jeff Kindhart, Dixon Springs Agricultural Center	618-695-2444	jkindhar@uiuc.edu
Extension Educators in IPM		
Suzanne Bissonnette, Champaign Extension Center	217-333-4901	sbisson@uiuc.edu
George Czapar, Springfield Extension Center	217-782-6515	gfc@uiuc.edu
Dave Feltes, Quad Cities Extension Center	309-792-2500	dfeltes@uiuc.edu
Russell Higgins, Matteson Extension Center	708-720-7520	rahiggin@uiuc.edu
Campus-based Specialists		
Mohammad Babadoost, Plant Pathology	217-333-1523	babadoos@uiuc.edu
Mosbah Kushad, Fruit & Vegetable Production	217-244-5691	kushad@uiuc.edu
John Masiunas, Weed Science	217-244-4469	masiunas@uiuc.edu
Chuck Voigt, Vegetable Production (& herbs)	217-333-1969	cevoigt@uiuc.edu
Rick Weinzierl, Entomology	217-333-6651	weinzier@uiuc.edu

Return Address:

Rick Weinzierl
Department of Crop Sciences
University of Illinois
1102 South Goodwin Ave.
Urbana, IL 61801